

Quidway S3700 Series Ethernet Switches V100R006C00

# **Hardware Description**

Issue 03

Date 2012-07-20



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# **About This Document**

# **Intended Audience**

This document provides an overall description of the S3700, details about each chassis and module, cables available to the device, and lists of components.

This document describes hardware features of the S3700, which helps intended readers obtain detailed information about each chassis, module and cable, and rapidly locate specific information through lists of components.

This document is intended for:

- Network planning engineers
- Hardware installation engineers
- Commissioning engineers
- On-site maintenance engineers
- System maintenance engineers

# **Symbol Conventions**

The symbols that may be found in this document are defined as follows.

Symbol	Description
<b>DANGER</b>	Indicates a hazard with a high level of risk, which if not avoided, will result in death or serious injury.
<b>MARNING</b>	Indicates a hazard with a medium or low level of risk, which if not avoided, could result in minor or moderate injury.
A CAUTION	Indicates a potentially hazardous situation, which if not avoided, could result in equipment damage, data loss, performance degradation, or unexpected results.
©—"L TIP	Indicates a tip that may help you solve a problem or save time.
NOTE	Provides additional information to emphasize or supplement important points of the main text.

# **Change History**

Updates between document issues are cumulative. Therefore, the latest document issue contains all updates made in previous issues.

## Changes in Issue 03 (2012-07-20)

Based on issue 02 (2012-04-30), the document is updated as follows:

The following information is modified:

- 1 Overview of the S3700
- 4 Cables

## Changes in Issue 02 (2012-04-30)

Based on issue 01 (2011-07-15), the document is updated as follows:

The following information is modified:

- 1.3 Device Structure
- 6 List of Optical Modules

## Changes in Issue 01 (2011-07-15)

Initial commercial release.

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# 1 Overview of the S3700

# **About This Chapter**

#### 1.1 Introduction

This section describes the characteristics of the S3700.

#### 1.2 S3700 Device Models and Naming Rules

This section describes device models and naming rules of the S3700.

#### 1.3 Device Structure

This section describes the structure of the S3700.

#### 1.4 ESD Jack

This section describes the functions of the ESD jack on the S3700.

- 1.5 System Configuration
- 1.6 Physical Specifications

#### 1.1 Introduction

This section describes the characteristics of the S3700.

# 1.1.1 Positioning



#### **WARNING**

The Quidway S3700 Ethernet switches are class A products. Customers should take preventative measures as the operating devices may cause radio interference.

The Quidway S3700 switch (S3700 for short) is an enterprise networks access device that provides access and data transport functions. The S3700 is developed by Huawei to meet the requirements for reliable access, aggregation, and high-quality transmission of multiple services on an enterprise networks . The S3700 functions as the access device of the enterprise networks. The S3700 provides large capacity, high port density, and cost-effective packet forwarding capabilities. The S3700 also provides multi-service access capabilities, excellent extensibility, quality of service (QoS) guarantee, powerful multicast replication, and carrier-class security, and can be used to build high-reliability ring topologies.

## 1.1.2 Product Characteristics

## **Energy-Saving Design**

The S3700 saves energy in the following ways:

• Some models adopt natural heat dissipation, so fans are not required.

M NOTE

Currently, the S3700-28TP-EI-MC-AC, S3700-28TP-SI-AC, S3700-28TP-SI-DC, S3700-28TP-EI-AC, and S3700-28TP-EI-DC adopt natural heat dissipation.

- The interface chip switches to the power saving mode when an interface is idle, which means that no peer device is connected to the interface.
- It uses advanced highly-integrated and energy-saving chips. With the help of the intelligent device management system, the chips improve system performance and also reduce system power consumption.

Natural heat dissipation has the following advantages:

- Product reliability is high.
- There is no noise pollution.
- Fans do not need to be maintained periodically, which saves the maintenance cost.
- The system does not have additional power consumption generated by fans, which improves the power efficiency.
- Boards are prevented from being eroded.

### **Advanced Surge Protection Technique**

The S3700 uses the Huawei patented built-in surge protection technique. This technique protects devices against lightning in terrible weather and increases device security.

#### **Convenient PoE Power Supply**

The S3700 PoE model has the Power over Ethernet (PoE) function. It provides centralized power supply for IP phones, wireless access points (APs), portable device chargers, POS machines, cameras, and data collectors by using twisted pairs.

Complying with IEEE 802.3af and IEEE 802.3at, the S3700 PoE model is able to remotely provide power for the devices of different vendors. IEEE 802.3at delivers a maximum of 30 W power. This allows IEEE 802.3at to support IP video phones, dualband WiFi APs, IP cameras, multi-function STBs, and RFIDs, and simplifies the network.

The S3700 PoE model has the ability to control power supply based on time range, which effectively manages network devices, reduces power consumption, and lowers the OPEX.

# 1.2 S3700 Device Models and Naming Rules

This section describes device models and naming rules of the S3700.

#### **Device Models**

To meet diverse customer requirements, the S3700 provides a variety of models. **Table 1-1** lists these device models.

You can select a device model as required.

Table 1-1 Device models

Produ ct Series	Model	Maximum Number of Interfaces
S3700 S3700-28TP-SI-AC S3700-28TP-SI-DC S3700-28TP-EI-AC S3700-28TP-EI-DC S3700-28TP-EI-MC-AC		There are twenty-four 10/100BASE-T Ethernet interfaces, two GE SFP interfaces, and two GE combo interfaces (10/100/1000BASE-T +100/1000BASE-X).
	S3700-28TP-EI-24S-AC	There are twenty-four 100BASE-X Ethernet interfaces, two GE SFP interfaces, and two GE combo interfaces (10/100/1000BASE-T +100/1000BASE-X).
	S3700-52P-SI-AC S3700-52P-EI-AC S3700-52P-EI-DC	There are forty-eight 10/100BASE-T Ethernet interfaces, two 100/1000BASE-X Ethernet optical interfaces, and two GE SFP interfaces.

Produ ct Series	Model	Maximum Number of Interfaces
	S3700-52P-EI-24S-AC S3700-52P-EI-24S-DC	There are twenty-four 10/100BASE-T Ethernet interfaces, twenty-four 100BASE-X Ethernet interfaces, two 100/1000BASE-X Ethernet optical interfaces, and two GE SFP interfaces.
	S3700-52P-EI-48S-AC S3700-52P-EI-48S-DC	There are forty-eight 100BASE-X Ethernet interfaces, two 100/1000BASE-X Ethernet optical interfaces, and two GE SFP interfaces.
	S3700-28TP-PWR-EI	There are twenty-four 10/100BASE-T Ethernet interfaces, two GE SFP interfaces, and two GE combo interfaces (10/100/1000BASE-T +100/1000BASE-X).
	S3700-52P-PWR-EI	There are forty-eight 100BASE-X Ethernet interfaces, two 100/1000BASE-X Ethernet optical interfaces, and two GE SFP interfaces.

## **Naming Rules**

The following are the naming rules of the S3700-28TP-PWR-EI, S3700-52P-EI-24S-DC, S3700-28TP-SI-AC and S3700-28TP-EI-MC-AC.

Figure 1-1 Naming rules

Ide ntifi er	Description
A	Switch.
В	Product series. "37" indicates the S3700 series.
С	Maximum number of interfaces.  NOTE  The number of interfaces on an S3700 can be 28, or 52, depending on the device model.
D	<ul> <li>Uplink interface type:</li> <li>P: A device has optical interfaces.</li> <li>TP: A device has combo interfaces supporting optical and electrical interfaces.</li> </ul>
E	The S3700 supports Power over Ethernet (PoE).  NOTE  If this letter is not displayed, PoE is not supported.

Ide ntifi er	Description
F	Software version type:
	EI: enhanced version, supporting enhanced features
	SI: standard version, supporting basic features
G	Downlink interface type. The value 24S indicates that 24 downlink interfaces of the S3700-52P-EI-24S are optical interfaces.  NOTE  If this letter is not displayed, all downlink interfaces are electrical interfaces.
Н	Powering mode:
	AC: alternating current power
	DC: direct current power
I	The device has monitoring interfaces.

# 1.3 Device Structure

This section describes the structure of the S3700.

The S3700 adopts an integrated hardware platform that provides the front-access structure. An S3700 consists of the chassis, power supply unit, fan, and switch control unit (SCU). The width of an S3700 complies with industry standards, and the S3700 can be installed in an IEC297 cabinet or an ETSI cabinet.

#### M NOTE

The S3700 is 1 U (1 U = 44.45 mm) high.

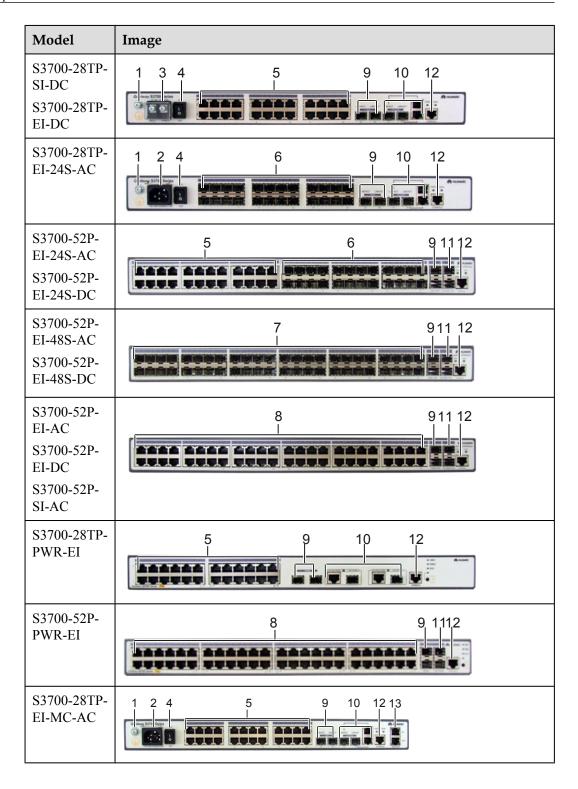
- The dimensions of S3700-28TP-EI-MC-AC, S3700-28TP-SI-AC, S3700-28TP-EI-AC, S3700-28TP-SI-DC, S3700-28TP-EI-DC, S3700-28TP-EI-DC, S3700-52P-EI-DC or S3700-52P-EI-AC are 442.0 mm x 220.0 mm x 43.6 mm (width x depth x height).
- The dimensions of S3700-52P-EI-24S-AC, S3700-52P-EI-24S-DC, S3700-52P-EI-48S-AC, S3700-52P-EI-48S-DC, S3700-28TP-PWR-EI or S3700-52P-PWR-EI are 442.0 mm×420.0 mm×43.6 mm (width x depth x height).

#### S3700 Appearances

**Table 1-2** shows the front views of S3700.

Table 1-2 S3700 front views

Model	Image
S3700-28TP- SI-AC S3700-28TP- EI-AC	1 2 4 5 9 10 12



1. Ground screw	2. AC jack	3. DC jack	4. Switch
-----------------	------------	------------	-----------

5. Twenty-four 10/100BASE-T Ethernet interfaces	6. Twenty-four 100BASE-X Ethernet interfaces	7. Forty-eight 100BASE-X Ethernet interfaces	8. Forty-eight 10/100BASE-T Ethernet interfaces
9. Two 1000M uplink interfaces (SFP)	10. Two 1000M combo interfaces (10/100/1000BASE- T+100/1000BASE- X)	11. Two 100/1000BASE-X Ethernet optical interfaces	12. One console interface
13. Two monitoring ports			

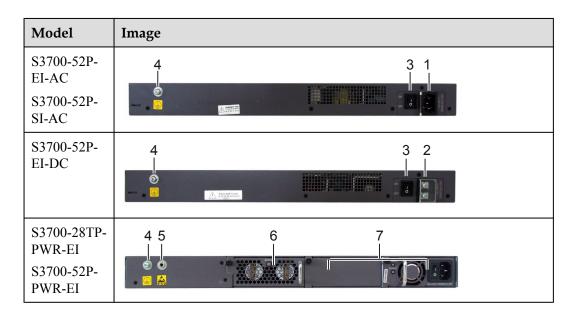
#### **□** NOTE

By default, a combo interface works in the auto mode. In the auto mode, if the electrical interface is connected to a network cable first, the combo interface works as an electrical interface to transmit data; if the optical interface is connected to a fiber first, the combo interface works as an optical interface to transmit data. If the electrical interface and optical interface are connected simultaneously, the combo interface works as an optical interface.

**Table 1-3** shows the rear views of S3700.

Table 1-3 S3700 rear views

Model	Image
S3700-28TP- SI-AC S3700-28TP-	
EI-AC S3700-28TP- SI-DC	
S3700-28TP- EI-DC	
S3700-28TP- EI-MC-AC	
S3700-28TP- EI-24S-AC	
S3700-52P- EI-24S-AC S3700-52P- EI-48S-AC	3 1
S3700-52P- EI-24S-DC S3700-52P- EI-48S-DC	4 3 2 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1



1. AC jack	2. DC jack	3. Switch	4. Ground screw
5. ESD jack	6. Fan module	7. Power supply unit slot	

# 1.4 ESD Jack

This section describes the functions of the ESD jack on the S3700.

The S3700 has an electromagnetic discharge (ESD) jack on the chassis.

When installing the S3700, wear an ESD wrist strap. Connect the ESD wrist strap to the ESD jack on the chassis, as shown in **Figure 1-2**.

Figure 1-2 ESD jack



# 1.5 System Configuration

Table 1-4 System configuration

Item	Parameter
Processor	S3700-28TP: 300 MHz
	S3700-52P: 200 MHz

Item	Parameter
Switching capacity	<ul> <li>S3700-28TP: 12.8 Gbit/s</li> <li>S3700-52P: 17.6 Gbit/s</li> </ul>
Packet forwarding capacity	<ul> <li>S3700-28TP: 9.6 Mpps</li> <li>S3700-52P: 13.1 Mpps</li> </ul>
DDR memory	128 MB
Flash Memory	16 MB

# 1.6 Physical Specifications

Table 1-5 Physical specifications

Item	Description
Dimensions (width x depth x height)	• S3700-28TP-EI-MC: 442.0 mm x 220.0 mm x 43.6 mm
	• S3700-28TP-SI/EI: 442.0 mm x 220.0 mm x 43.6 mm
	• S3700-28TP-EI-24S: 442.0 mm x 220.0 mm x 43.6 mm
	• S3700-52P-SI/EI: 442.0 mm x 220.0 mm x 43.6 mm
	• S3700-52P-EI-24S: 442.0 mm x 420.0 mm x 43.6 mm
	• S3700-52P-EI-48S: 442.0 mm x 420.0 mm x 43.6 mm
	• S3700-28TP-PWR-EI: 442.0 mm x 420.0 mm x 43.6 mm
	• S3700-52P-PWR-EI: 442.0 mm x 420.0 mm x 43.6 mm
Maximum power (full configuration)	• S3700-28TP-EI-MC: 20 W
	• S3700-28TP-SI/EI: 20 W
	• S3700-28TP-EI-24S: 52 W
	• S3700-52P-SI/EI: 38 W
	• S3700-52P-EI-24S: 65 W
	• S3700-52P-EI-48S: 90 W
	• S3700-28TP-PWR-EI: 818 W (Dissipated power: 78 W, PoE: 740 W)
	• S3700-52P-PWR-EI: 880 W (Dissipated power: 140 W, PoE: 740 W)

Item		Description
Weight	Full configura tion	≤ 6.5 kg
	Empty chassis	≤ 5 kg
DC input voltage	Rated voltage	-48V DC to -60V DC
	Maximu m voltage	-36V DC to -72V DC
AC input voltage	Rated voltage	100V AC to 240V AC
	Maximu m voltage	90V AC to 264V AC
Temperature	operating temperatu re	0°C to 50°C
	Storage temperatu re	-40°C to 70°C
Relative humidity		10%RH to 90%RH
Altitude		0 m to 2000 m

# **2** Power Supply Unit

# **About This Chapter**



#### CAUTION

- Only the power supply units of the same power can be used on an S3700.
- Power supply units are hot-swappable in the 1:1 scenario but it is strongly recommended to shutdown power supply unit before replacement in order to avoid electrical shock.
- Before powering off the S3700, shut down all its power supply units.

#### 2.1 Power Supply Configuration

This section describes the power supply configuration on the S3700.

#### 2.2 Power Supply Unit Working Mode

This section describes the working mode of S3700 power supply units.

#### 2.3 AC PoE Power Supply Units

This section describes the functions, appearance, switch, indicators, and technical specifications of the S3700 AC PoE power supply unit.

# 2.1 Power Supply Configuration

This section describes the power supply configuration on the S3700.

#### **PoE Power Supply**

The downlink electrical interfaces of S3700 PoE switches provide PoE power. Each interface provides a maximum of 30 W power and supports a maximum of 100 m power supply distance. The S3700 can transmit both current and data on a pair of signal cables.

PoE power supply units are classified into two types: 500 W power supply and 250 W power supply.

Power Supply Unit	PoE Power of total Power Supply	Device Power of total Power Supply
500 W power supply	369.6 W	120 W
250 W power supply	123.2 W	120 W

The S3700 PoE switches include:

#### • S3700-28TP-PWR-EI:

Each switch provides two power supply unit slots. Each slot accommodates a 500 W or 250 W power supply unit. The power supply configurations are shown in the following table.

Power Supply Unit		PoE Power of total Power Supply	Maximum Number of PoE Interfaces
250 W power supply	-	123.2 W	<ul><li>802.3af: 8</li><li>802.3at: 4</li></ul>
500 W power supply	-	369.6 W	<ul><li>802.3af: 24</li><li>802.3at: 12</li></ul>
250 W power supply	250 W power supply	246.4 W	<ul><li>802.3af: 16</li><li>802.3at: 8</li></ul>
500 W power supply	500 W power supply	739.2 W	<ul><li>802.3af: 24</li><li>802.3at: 24</li></ul>

#### • S3700-52P-PWR-EI:

Each switch provides two power supply unit slots. Each slot accommodates a 500 W or 250 W power supply unit. The power supply configurations are shown in the following table.

Power Supply Unit		PoE Power of total Power Supply	Maximum Number of PoE Interfaces
250 W power supply	-	123.2 W	<ul><li>802.3af: 8</li><li>802.3at: 4</li></ul>
500 W power supply	-	369.6 W	<ul><li>802.3af: 24</li><li>802.3at: 12</li></ul>
250 W power supply	250 W power supply	246.4 W	<ul><li>802.3af: 16</li><li>802.3at: 8</li></ul>
500 W power supply	500 W power supply	739.2 W	<ul><li>802.3af: 48</li><li>802.3at: 24</li></ul>

#### M NOTE

When two power supply units are used, they work in redundancy backup mode to provide power for the device and in load balancing mode to provide power for PDs.

# **Non-PoE Power Supply Configuration**

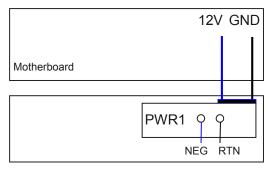
The S3700 non-PoE switches do not support hot swappable power supply units.

# 2.2 Power Supply Unit Working Mode

This section describes the working mode of S3700 power supply units.

# 2.2.1 Working Mode of DC Power Supply Units

Figure 2-1 Working mode of DC power supply units



NEG: Power wire

RTN: Ground wire

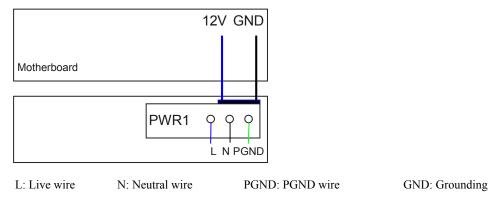
GND: Grounding

On a switch, after the - 48V DC power is transmitted to the PWR module, the PWR module outputs 12 V voltage, and provides power for the entire device.

# 2.2.2 Working Mode of Non-PoE AC Power Supply Units

The working mode of the S3700 non-PoE AC power supply units is shown in Figure 2-2.

Figure 2-2 Working mode of non-PoE AC power supply units

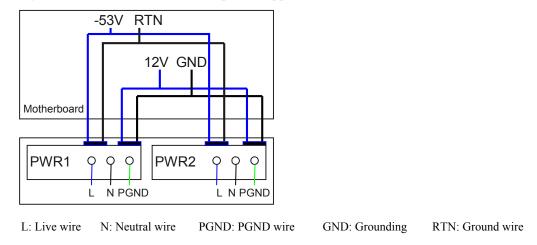


On a switch, after the AC power is transmitted to the PWR module, the PWR module outputs 12 V voltage, and provides power for the entire device.

# 2.2.3 Working Mode of PoE AC Power Supply Units

The working mode of S3700 PoE AC power supply units is shown in Figure 2-3.

Figure 2-3 Working mode of a PoE power supply unit on the



After the PoE power is transmitted to the PWR module on the , the PWR module outputs 12 V and -53 V voltage, and then the motherboard provides 12 V voltage for the entire switch and -53 V voltage for the powered devices (PDs).

# 2.3 AC PoE Power Supply Units

This section describes the functions, appearance, switch, indicators, and technical specifications of the S3700 AC PoE power supply unit.

#### 2.3.1 Function Overview

Power over Ethernet (PoE) refers to power supply over a 10Base-T, 100Base-TX, or 1000Base-T twisted pair cable.

PoE provides power for terminals such as IP phones, access points (APs), portable device chargers, point-of-sale (POS) machines, cameras, and data collectors. These terminals are powered when they access the network, so the indoor power supply systems are not required. Complying with IEEE 802.3af and IEEE 802.3at, the PoE S3700 is able to remotely provide power for the devices of different vendors. IEEE 802.3af supports a maximum of 15.4 W power and IEEE 802.3at supports a maximum of 30 W power.

The PoE function transmits power together with data to terminals over cables or transmits power without data over idle lines. The S3700 can transmit power together with data at a rate of up to 100 Mbit/s.

#### 2.3.2 Panel

The S3700 supports the 250 W PoE power supply unit, as shown in **Figure 2-4**, and 500 W PoE power supply unit, as shown in **Figure 2-5**. The power fan appearances of the two power supply units are different.

Figure 2-4 Appearance of the 250 W AC PoE power supply unit

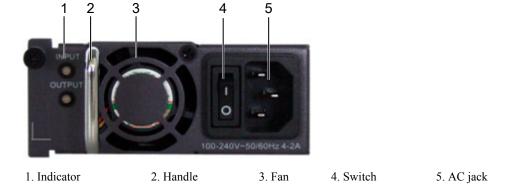
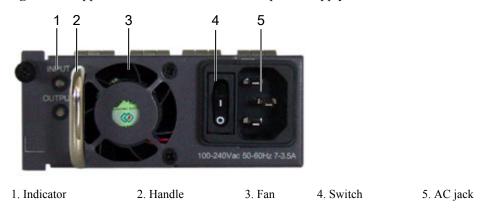


Figure 2-5 Appearance of the 500 W AC PoE power supply unit



**Table 2-1** describes the meanings of the indicator.

 Table 2-1 Description of the AC PoE power indicators

Name	Status	Description
INPUT	Green	The input power is within range.
	Red	The input power is out of range, for example:
		Undervoltage
		Overvoltage
	Off	The power cable is loose or no input AC power is provided.
OUTPUT	Green	The AC output power is within range.
	Red	The output power is out of range, for example:
		Abnormal power fan operation
		Output overvoltage
		Output overcurrent
		Short circuit
		Overtemperature
	Off	The power cable is loose or no input AC power is provided.

# 2.3.3 Technical Specifications

Table 2-2 describes the technical specifications of the AC PoE power supply unit.

Table 2-2 Technical specifications of the AC PoE power supply unit

Item	250 W PoE	500 W PoE
Dimensions (width x depth x height)	100 mm x 220 mm x 43 mm	
Weight	0.8 kg	1.06 kg
Rated input voltage	100 V AC to 240 V AC, 50/60 Hz	
Maximum input voltage	90 V AC to 264 V AC, 47 Hz to 63 Hz	
Maximum input current	4 A to 2 A	7 A to 3.5 A

Item	250 W PoE	500 W PoE
Maximum output current	<ul><li>12 V: 10 A</li><li>-53.5 V: 2.5 A</li></ul>	<ul><li>12 V: 10 A</li><li>-53.5 V: 7.11 A</li></ul>
Maximum output power	PoE: 130 W Total: 250 W	PoE: 380 W Total: 500 W

### $\;\; \bigsqcup \; \mathsf{NOTE}$

A PoE power supply unit provides 12 V voltage for the entire device and -53.5 V voltage for powered devices (PDs).

# 3 Heat Dissipation System

# **About This Chapter**

This chapter describes the heat dissipation system of the S3700.

#### 3.1 Heat Dissipation Mode

This section describes the heat dissipation modes of the S3700.

#### 3.2 Fan Module

This section describes the appearance and technical specifications of the S3700 fan module.

# 3.1 Heat Dissipation Mode

This section describes the heat dissipation modes of the S3700.

The heat dissipation system ensures that the S3700 operates at a normal temperature. The operating temperature of the S3700 is the long-term operating temperature in Physical Specifications.

The heat dissipation system can be in the following modes:

- Natural heat dissipation
- Intelligent heat dissipation
- Forcible heat dissipation

**Table 3-1** provides the S3700 models corresponding to each heat dissipation mode.

**Table 3-1** S3700 heat dissipation modes

Heat Dissipati on Mode	Model
Natural heat dissipation	<ul> <li>\$3700-28TP-SI-AC</li> <li>\$3700-28TP-SI-DC</li> <li>\$3700-28TP-EI-AC</li> <li>\$3700-28TP-EI-DC</li> <li>\$3700-28TP-EI-MC-AC</li> </ul>
Intelligent heat dissipation	<ul> <li>\$3700-52P-SI-AC</li> <li>\$3700-52P-EI-AC</li> <li>\$3700-52P-EI-DC</li> </ul>
Forcible heat dissipation	<ul> <li>\$3700-52P-EI-24S-AC</li> <li>\$3700-52P-EI-24S-DC</li> <li>\$3700-52P-EI-48S-AC</li> <li>\$3700-52P-EI-48S-DC</li> <li>\$3700-28TP-EI-24S-AC</li> <li>\$3700-28TP-PWR-EI</li> <li>\$3700-52P-PWR-EI</li> </ul>

#### **□** NOTE

The fans of S3700-52P-EI-24S-AC, S3700-52P-EI-24S-DC, S3700-52P-EI-48S-AC, S3700-52P-EI-48S-DC, and S3700-28TP-EI-24S-AC support Pulse Width Modulation (PWM) speed adjustment.

The fans can work in the intelligent mode or forcible mode.

In the intelligent mode, the fans start to operate only when the ambient temperature goes higher than a specified value.

The following table describes the air circulation through the S3700 chassis.

N o	Air Circulation	Model
1		<ul> <li>\$3700-28         TP-PWR-EI         </li> <li>\$3700-52         P-PWR-EI     </li> </ul>
2		<ul> <li>\$3700-52</li> <li>P-SI-AC</li> <li>\$3700-52</li> <li>P-EI-AC</li> <li>\$3700-52</li> <li>P-EI-DC</li> </ul>
3		<ul> <li>S3700-28         TP-         EI-24S-         AC</li> <li>S3700-52         P-EI-24S-         AC</li> <li>S3700-52         P-EI-24S-         DC</li> <li>S3700-52         P-EI-48S-         AC</li> <li>S3700-52         P-EI-48S-         AC</li> <li>NOTE         On         S3700-28TP-         EI-24S-AC,         air also flows into the chassis from the left side.</li> </ul>

## 3.2 Fan Module

This section describes the appearance and technical specifications of the S3700 fan module.

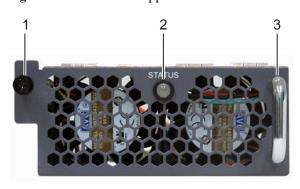
## **Appearance**

The S3700 fan module consists of two fans. The fans can be replaced when the device is operating.

The fan module can be installed on S3700-28TP-PWR-EI and S3700-52TP-PWR-EI.

Figure 3-1 shows the appearance of the fan module.

Figure 3-1 Fan module appearance



1. Captive screw

2. Indicator

3. Handle

#### **Indicator**

Table 3-2 describes the fan module indicator of the S3700.

Table 3-2 Fan indicator description

Name	Color	Description
STATUS	Blinking green (1 Hz)	The fan module is operating properly.
	Blinking red (1 Hz)	The fan module is faulty.

## **Technical Specifications**

Table 3-3 describes the technical specifications of the S3700 fan module.

**Table 3-3** Fan module technical specifications

Item	Specification
Dimensions (width x depth x height)	103.0 mm x 99.2 mm x 39.6 mm
Weight	230 g to 270 g
Maximum power consumption	12 W
Maximum wind pressure	375 Pa
Maximum wind rate	40 CFM
Maximum noise	60 dB
Operating voltage	12 V DC

 $oldsymbol{4}_{\mathsf{Cables}}$ 

# **About This Chapter**

#### 4.1 DC Power Cables

A DC power cable transmits DC power to the switch.

#### 4.2 AC Power Cables

An AC power cable transmits AC power to the switch.

#### 4.3 Ground Cables

A ground cable protects the device from lightning strike and electromagnetic interference.

#### 4.4 Console Cables

A console cable is used to debug or maintain a local S3700.

#### 4.5 Network Cables

A network cable subtends devices, enables a device to communication with other network devices, and allows users to locally or remotely maintain the device.

#### 4.6 Optical Fibers

An optical fiber connects the optical interface of a device to an upstream device or optical network terminal.

#### 4.7 Stack cables

This section describes the structure and technical specifications of a stack cable.

## 4.1 DC Power Cables

A DC power cable transmits DC power to the switch.

## **Applications**

A DC power cable connects the following two interfaces:

- Input power jack on the chassis
- Output power interface on an external power system

## $\square$ NOTE

A black -48 V DC power return wire (RTN) is connected to the RTN(+) end of the DC power supply. A blue -48 V DC power cable is connected to the NEG(-) end of the DC power supply.

### Appearance and Structure

The black -48 V DC power return wire and the blue -48 V DC power cable are shown in **Figure 4-1** and **Figure 4-2**.

Figure 4-1 -48 V DC power return wire





Figure 4-2 -48 V DC power cable

# 4.2 AC Power Cables

An AC power cable transmits AC power to the switch.

# **Applications**

An AC power cable connects the following:

- AC input power jack on the chassis
- Mains supply

## **Appearance**

Figure 4-3 shows the appearance of an AC power cable.



Figure 4-3 Appearance of an AC power cable

# 4.3 Ground Cables

A ground cable protects the device from lightning strike and electromagnetic interference.

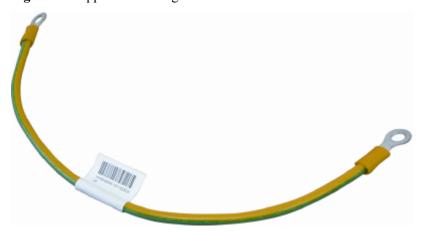
# **Applications**

A ground cable connects the chassis to the ground.

# **Appearance**

Figure 4-4 shows the appearance of a ground cable.

Figure 4-4 Appearance of a ground cable



### 4.4 Console Cables

A console cable is used to debug or maintain a local S3700.

## **Applications**

A console cable connects the console port of the S3700 to the serial port of an operation terminal to transmit configuration data. A shielded cable or an unshielded cable can be used according to the onsite situation.

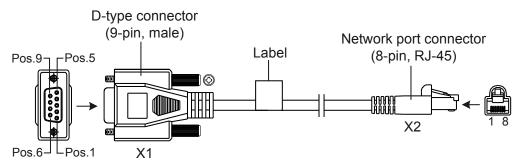
A console cable connects the S3700 and terminal as follows:

- The 8-pin RJ45 connector is inserted into the S3700 console port.
- The DB9 connector is inserted into the terminal serial port.

#### Appearance and Structure

Figure 4-5 shows the structure of a console cable.

Figure 4-5 Structure of a console cable



## **Pin Assignments**

**Table 4-1** describes the pin assignments of a console cable.

Table 4-1 Pin assignments of a console cable

Connector	X2 (RJ45)	Direction	X1 (DB9)	Signal
Pin	1	>	8	Clear to Send (CTS)
assignment	2	>	6	Data Set Ready (DSR)
	3	>	2	Receive Data (RXD)
	4		5	GND
	5		5	GND
	6	<	3	Transmit Data (TXD)

Connector	X2 (RJ45)	Direction	X1 (DB9)	Signal
	7	<	4	Data Terminal Ready (DTR)
	8	<	7	Request to Send (RTS)

## 4.5 Network Cables

A network cable subtends devices, enables a device to communication with other network devices, and allows users to locally or remotely maintain the device.

## **Applications**

A network cable connects a maintenance terminal to the console port on the main control board for local or remote maintenance.

The network cables are classified into straight through cables and crossover cables.

- A straight-through cable connects a terminal, such as a computer or switch, to the network. The straight-through cable uses two RJ45 connectors, which have the same pinout.
- A crossover cable connects two terminals, such as computers or switches. The crossover cable uses two RJ45 connectors, which have difference pinouts.

### Appearance and Structure

#### $\square$ NOTE

- Generally, a network cable is a standard unshielded network cable that uses RJ45 connectors.
- The appearances of the straight-through cable and the crossover cable are the same.

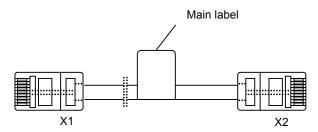
Figure 4-6 shows the appearance of a network cable.



Figure 4-6 Appearance of a network cable

Figure 4-7 shows the appearance of a network cable.

Figure 4-7 Structure of a network cable



## **Pin Assignments**

Table 4-2 describes the pin assignments of a straight-through cable.

Table 4-2 Pin assignments of a straight-through cable

X1 Pin	Tip Color	X2 Pin
1	White and orange	1
2	Orange	2
3	White and Green	3

X1 Pin	Tip Color	X2 Pin
4	Blue	4
5	White and Blue	5
6	Green	6
7	White and brown	7
8	Brown	8

**Table 4-3** describes the pin assignments of a crossover cable.

Table 4-3 Pin assignments of a crossover cable

X1 Pin	Tip Color	X2 Pin
1	White and orange	3
2	Orange	6
3	White and Green	1
4	Blue	4
5	White and Blue	5
6	Green	2
7	White and brown	7
8	Brown	8

#### **□** NOTE

To achieve the optimum electrical transmission performance, ensure that the wires connected to pins 1 and 2 and to pins 3 and 6 are twisted pairs.

# 4.6 Optical Fibers

An optical fiber connects the optical interface of a device to an upstream device or optical network terminal.

## **Applications**

An optical fiber carries optical signals and transmits them over short distance. An optical fiber connects the following:

- Optical interface on a board
- Optical distribution frame (ODF) or the optical interface on another device

Table 4-4 lists the classification of optical fibers.

Table 4-4 Optical fiber classification

No.	Purpose	Local End Connector	Remote End Connector	Mode
1	To connect LPU of the device to the ODF	LC/PC	FC/PC	Single mode, indoor
2	To connect LPUs of two devices	LC/PC	LC/PC	Single mode/ multimode, indoor
3	To connect LPU of the device to another device	LC/PC	SC/PC or LC/ PC	Single mode/ multimode, indoor

## **Appearance**

The appearances of the single-mode optical fiber and the multimode optical fiber are the same, but their colors are different. The single-mode optical fiber is yellow, and the multi-mode optical fiber is orange.



## **CAUTION**

When connecting or removing the LC/PC optical connector, align the connector with the optical interface, and do not rotate the fiber. Pay attention to the following points:

- Align the head of the fiber jumper with the optical interface and insert the optical fiber into the interface gently.
- To remove the fiber, press the latch on the connector and pull the fiber out.

Figure 4-8 shows the appearance of a single mode fiber.

Figure 4-8 Single mode fiber with LC/PC connectors

Figure 4-9 shows the appearance of a multimode fiber.

Figure 4-9 Multimode fiber with LC/PC connectors



## **Pin Assignments**

Table 4-5 describes the pin assignments of an optical fiber.

Table 4-5 Pin assignments of an optical fiber

Local End Terminal	Signal Direction	Remote End Terminal
Optical interface Tx terminal	->	Optical interface Rx terminal
Optical interface Rx terminal	<-	Optical interface Tx terminal

## **Fiber Selection Criterion**

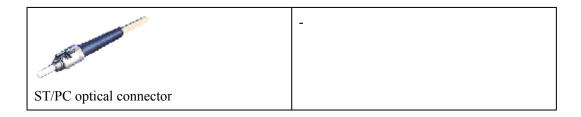
**Table 4-6** lists the criteria for selecting optical fibers. **Table 4-7** lists common optical connectors.

Table 4-6 Fiber selection criterion

Parameter	Criterion	
Length	Survey result	
Single mode or multimode	Optical module type  • The optical transmitting module of the multi-mode is connected to the multimode fiber.	
	<ul> <li>The optical transmitting module of the single-mode is connected to the single mode fiber.</li> <li>NOTE         If the optical fiber jumper is used, the connector connected to the device must be the LC/PC connector, and the connector connected to the remote end must be of the same type as the remote end interface.     </li> </ul>	
Connector shape	<ul> <li>Cube: SC/PC, LC/PC, and MTRJ/PC</li> <li>Column: ST/PC and FC/PC</li> </ul>	

**Table 4-7** Common optical connectors

SC/PC optical connector	LC/PC optical connector
FC/PC optical connector	MTRJ/PC optical connector



## 4.7 Stack cables

This section describes the structure and technical specifications of a stack cable.

## **Applications**

A stack cable of the S3700 is the SFP stack cable, which interconnects the specified interfaces. The S3700s connected with a stack cable form a logical switch to forward packets.

NOTE

The two ends of a stack cable are covered by the ESD-preventive caps.

## Appearance and Structure

Figure 4-10 shows the structure of a stack cable.

Figure 4-10 Structure of a stack cable



## **Specifications**

**Table 4-8** lists the specifications of a stack cable.

 Table 4-8 Specifications of a stack cable

Item	Description
Cable type	SFP high-speed transmission cable, indoor, (SFP 20 male), (SFP 20 male), SFP, (CC2P0.32 black)-1.5 m
Connector X1/X2	SFP, 20-pin, male
Color	Black

Item	Description
Pin	Two pairs
Length	1.5 m
Bend radius	75 mm

# 5 List of Indicators

# **About This Chapter**

This chapter describes the status and meanings of the indicators on the S3700, including the indicators for subcards, fan module, and power supply units.

#### 5.1 Indicators on the Front Panel

This section describes the indicators on the S3700 front panel.

#### 5.2 Fan Indicators

This section describes the fan indicators.

#### 5.3 Power Indicators

This section describes the power indicators.

## 5.1 Indicators on the Front Panel

This section describes the indicators on the S3700 front panel.

## Indicators of a Non-PoE S3700

S3700-28TP-SI-AC is a non-PoE switch that has a single power supply unit.

Figure 5-1 S3700-28TP-SI-AC indicators



Table 5-1 Description of S3700-28TP-SI-AC indicators

No.	Indicator	Identifier	Status	Description
1	Power	PWR	Off	The switch is powered off.
	indicator		Green	The switch is powered on.
2	System	RUN	Off	The system is not operating.
status indicator			Green	The system is not operating properly or is starting.
			Blinking green	The system is operating properly.
3	Port indicator	LNK/ACT	Off	The interface is not connected or has been shut down.
			Green	The interface is connected.
			Blinking green	The interface is sending or receiving data.

## **Indicators of a PoE S3700**

S3700-52P-PWR-EI is a PoE switch.

Figure 5-2 S3700-52P-PWR-EI indicators



 Table 5-2 Description of S3700-52P-PWR-EI indicators

No.	Indicator	Identifier	Status	Description
1	Power indicator		Off	The power supply units are not present, or the power supply is abnormal when a single power supply unit is used.
			Green	The power supply is normal.
			Red	<ul> <li>Two power supply units are installed properly, but not switched on.</li> <li>The power supply units are switched off.</li> <li>The card power and PoE power are abnormal.</li> </ul>
			Orange	If a single power supply unit is installed, the PoE power is out of range. If two power supply units are installed, the card power or PoE power is out of range.
2	Power indicator		Off	The power supply units are not present, or the power supply is abnormal when a single power supply unit is used.
			Green	The power supply is normal.

No.	Indicator	Identifier	Status	Description
		Re	Red	<ul> <li>Two power supply units are installed properly, but not switched on.</li> <li>The power supply units are switched off.</li> <li>The card power and PoE power are abnormal.</li> </ul>
			Orange	If a single power supply unit is installed, the PoE power is out of range. If two power supply units are installed, the card power or PoE power is out of range.
3	System status indicator	SYS	Off	The system is not operating.
			Green	The system is not operating properly or is starting.
			Orange	The system is performing self-check during startup.
			Blinking green	The system is operating properly.
			Red	After registering, the system does not operate properly, or a power alarm, fan alarm, or temperature alarm is generated.
4	Mode indicator	-	Off	The service interface indicator is in the default mode (STAT).

No.	Indicator	Identifier	Status	Description
			Green	The service interface indicator indicates the interface speed. After 45 seconds, the service interface indicator automatically restores to off.
			Orange	The service interface indicator indicates the PoE status. After 45 seconds, the service interface indicator automatically restores to off.
			Red	The service interface indicator indicates the stack ID. After 45 seconds, the service interface indicator automatically restores to off.

As shown in Figure 5-2, the button marked "5" is the mode switching button. On an S3700, you can press the mode switching button to switch the display modes of interface indicators. The status of a mode indicator represents the display mode of the related interface indicator. For example, the mode indicator of S3700-28TP-PWR-EI is off and the interface indicators are in STAT state by default. When you press the mode switching button once, the mode indicator turns green and the related interface indicator enters the speed state. When you press the mode switching button for a second time, the mode indicator turns orange and the related interface indicator represents the PoE power status. When you press the mode switching button for a third time, the mode indicator turns red and the related interface indicator represents the stack status. When you press the mode switching button for a fourth time, the mode indicator restores to the default state (off). If you do not press the mode switching button within 45 seconds, the mode indicator automatically restores to off.

The following table describes the meanings of indicators.

Table 5-3 Description of indicators in different modes

Display Mode	Status	Description
STAT	Off	The interface is not connected or has been shut down.
	Green	The interface is connected.

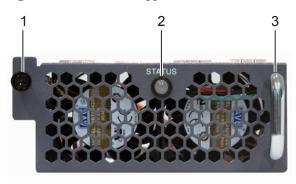
Display Mode	Status	Description		
	Blinking green	The interface is sending or receiving data.		
Speed	Off	The interface is not connected or has been shut down.		
	Green	The interface speed is 10/100 Mbit/s.		
	Blinking green	The interface speed is 1000 Mbit/s.		
РоЕ	Off	The interface does not provide remote power.		
	Green	The interface is providing remote power.		
	Blinking green	The power of the powered device (PD) exceeds the power supply capability of the port or exceeds the threshold.		
Stack	Off	The stack ID of the member switch is not the number of an interface in the off state.		
	Green	<ul> <li>The device is a not a command switch:</li> <li>If the indicator of an interface is always on, the number of this interface is the stack ID of the device.</li> <li>If the first nine interface indicators of the device are always on, the stack ID of the device is 0.</li> </ul>		
	Blinking green	<ul> <li>The device is a command switch:</li> <li>If the indicator of an interface blinks, the number of this interface is the stack ID of the device.</li> <li>If the first nine interface indicators of the device blink, the stack ID of the device is 0.</li> </ul>		

# **5.2 Fan Indicators**

This section describes the fan indicators.

The S3700 fan module consists of two fans. The fans can be replaced when the device is operating.

Figure 5-3 Fan module appearance



1. Captive screw

2. Indicator

3. Handle

Table 5-4 describes the fan indicators.

Table 5-4 Fan indicator description

Name	Color	Description
STATUS	Blinking green (1 Hz)	The fan module is operating properly.
	Blinking red (1 Hz)	The fan module is faulty.

## **5.3 Power Indicators**

This section describes the power indicators.

## **Non-PoE Power Indicators**

The non-PoE power indicators are displayed on the panel of the power supply unit through the lamp guide.

## ☐ NOTE

If a switch does not have a power supply unit, see section **5.1 Indicators on the Front Panel** for the PWR indicator description.

## **AC PoE Power Indicators**

Figure 5-4 Appearance of the 250 W AC PoE power supply unit

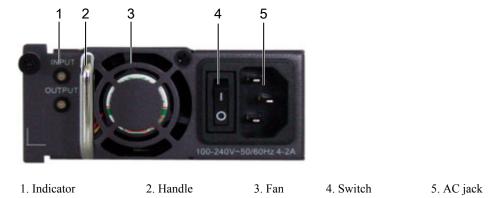
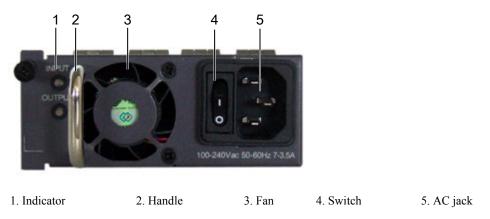


Figure 5-5 Appearance of the 500 W AC PoE power supply unit



**Table 5-5** describes the AC PoE power indicators.

Table 5-5 Description of the AC PoE power indicators

Name	Status	Description
INPUT	Green	The input power is within range.
	Red	The input power is out of range, for example:  • Undervoltage  • Overvoltage
	Off	The power cable is loose or no input AC power is provided.
OUTPUT	Green	The AC output power is within range.

Name	Status	Description
	Red	The output power is out of range, for example:
		Abnormal power fan operation
		Output overvoltage
		Output overcurrent
		Short circuit
		Overtemperature
	Off	The power cable is loose or no input AC power is provided.

# 6 List of Optical Modules

## **About This Chapter**

This section describes the attributes of optical modules supported by the S3700.

#### **□** NOTE

Only Huawei certified optical modules can be installed on the S3700. The non-certified optical modules are unreliable and may affect services. Huawei will not be responsible for fixing the issues caused by non-certified optical modules.

All the optical modules listed in the documentation are Huawei certified optical modules.

#### 6.1 SFP Optical Module (FE) Attributes

This section describes the attributes of an SFP optical module (FE).

## 6.2 ESFP Optical Module (FE) Attributes

This section describes the attributes of an ESFP optical module (FE).

#### 6.3 ESFP Optical Module (GE) Attributes

This section describes the attributes of an ESFP optical module (GE).

#### 6.4 ESFP CWDM-SFP Optical Module

This section describes the attributes of an ESFP CWDM-SFP optical module.

# 6.1 SFP Optical Module (FE) Attributes

This section describes the attributes of an SFP optical module (FE).

Table 6-1 SFP optical module (FE) attributes

Item	Description
Transmission distance	2 km
Center wavelength	1310 nm
Transmitting power	-19.0 dBm to -14.0 dBm
Receiver sensitivity	-30.0 dBm
Overload power	-14.0 dBm
Extinction ratio	10 dB
Connector type	LC
Fiber type	Multi-mode

#### **Ⅲ** NOTE

The SFP optical module (FE) is applicable to only the 100M SFP optical interfaces or 100M/1000M SFP optical interfaces.

# 6.2 ESFP Optical Module (FE) Attributes

This section describes the attributes of an ESFP optical module (FE).

**Table 6-2** ESFP optical module (FE) attributes

Item	Description							
Transmission distance	15 km	15 km (single- mode bidirectional fiber)	15 km (single- mode bidirectional fiber)	40 km	80 km			
Center wavelength	1310 nm	Tx: 1310 nm Rx: 1550 nm	Tx: 1550 nm Rx: 1310 nm	1310 nm	1550 nm			
Transmitting power	-15.0 dBm to -8.0 dBm	-15.0 dBm to -8.0 dBm	-15.0 dBm to -8.0 dBm	-5.0 dBm to 0 dBm	-5.0 dBm to 0 dBm			

Item	Description								
Receiver sensitivity	-31.0 dBm	-32.0 dBm	-32.0 dBm	-37.0 dBm	-37.0 dBm				
Overload power	-8.0 dBm	-8.0 dBm	-8.0 dBm	-10.0 dBm	-10.0 dBm				
Extinction ratio	8.2 dB	8.5 dB	8.5 dB	10.5 dB	10.5 dB				
Connector type	LC	LC/PC	LC/PC	LC	LC				
Fiber type	Single-mode								

## **□** NOTE

The ESFP optical module (FE) is applicable to only the 100M SFP optical interfaces or 100M/1000M SFP optical interfaces.

# 6.3 ESFP Optical Module (GE) Attributes

This section describes the attributes of an ESFP optical module (GE).

Table 6-3 ESFP optical module (GE) attributes

Item	Descrip	Description							
Transmi ssion distance	0.5 km	10 km	10 km (single- mode bidirect ional fiber)	10 km (single- mode bidirect ional fiber)	40 km	40 km	80 km	100 km	
Center wavelen gth	850 nm	1310 nm	Tx: 1310 nm Rx: 1490 nm	Tx: 1490 nm Rx: 1310 nm	1550 nm	1310 nm	1550 nm	1550 nm	
Transmi tting power	-9.5 dBm to -2.5 dBm	-9.0 dBm to -3.0 dBm	-9.0 dBm to -3.0 dBm	-9.0 dBm to -3.0 dBm	-5.0 dBm to 0 dBm	-5.0 dBm to 0 dBm	-2.0 dBm to 5.0 dBm	0 dBm to 5.0 dBm	
Receiver sensitivi ty	-17.0 dBm	-20.0 dBm	-19.5 dBm	-19.5 dBm	-22.0 dBm	-23.0 dBm	-23.0 dBm	-30.0 dBm	

Item	Description							
Overloa d power	0 dBm	-3.0 dBm	-3.0 dBm	-3.0 dBm	-3.0 dBm	-3.0 dBm	-3.0 dBm	-9.0 dBm
Extincti on ratio	9.0 dB	9.0 dB	6.0 dB	6.0 dB	8.5 dB	9.0 dB	9.0 dB	9.0 dB
Connect or type	LC							
Fiber type	Multi- mode	Single-m	ode					

## **□** NOTE

The ESFP optical module (GE) is applicable to only the 1000M SFP optical interfaces or 100M/1000M SFP optical interfaces or GE SFP/10G SFP+ Optical Interface.

# 6.4 ESFP CWDM-SFP Optical Module

This section describes the attributes of an ESFP CWDM-SFP optical module.

Table 6-4 ESFP CWDM-SFP optical module attributes

Item	Description									
Transmi ssion distance	80 km	80 km								
Center wavelen gth	1471 nm									
Transmi tting power	0 dBm to	0 dBm to 5.0 dBm								
Receiver sensitivi ty	-28.0 dB	-28.0 dBm								
Overloa d power	-9.0 dBm	-9.0 dBm								
Extincti on ratio	8.2 dB	8.2 dB								
Connect or type	LC									
Fiber type	Single-m	iode								

■ NOTE

The ESFP CWDM-SFP optical module is applicable to only the 100M SFP optical interfaces or 1000M SFP optical interfaces or 100M/1000M SFP optical interfaces or GE SFP/10G SFP+ Optical Interface.